

A Better Measure for B12

Vitamin B12 is actually a family of compounds called cobalamins, each of which has its own potential biological activity, in terms of absorption and potency. Meat and dairy products contain naturally occurring forms of B12. A synthetic form, called cyanocobalamin, is used to fortify foods and make dietary supplements in the United States. Currently, a time-consuming microbiological assay is used to analyze samples for their B12 content. This method measures only the total B12 content, not the individual forms.

A new method has been developed to measure cobalamins. It uses one of two separation techniques—capillary electrophoresis and micro-high-performance liquid chromatography—combined with a detection technique called inductively coupled plasma mass spectrometry. This hybrid method allows scientists to quickly detect and measure levels of specific individual cobalamins in food and supplement samples. *Nancy J. Miller-Ihli, USDA-ARS Food Composition Laboratory, Beltsville, Maryland; phone (301) 504-8252, e-mail miller-ihli@bhnrc.usda.gov.*

Super Soaker-Upper Tackles Books and Papers

A well-known and widely used super-absorbent, the starch-based polymer known as “Super Slurper” might find yet another innovative application. Its capacity to retain up to nearly 2,000 times its weight in moisture suggests that it could be helpful in restoring books, photographs, and other papery materials soaked by leaks, floods, or other watery disasters. Preliminary tests showed that the gel powder could dry wet books in about 10 minutes, whereas air drying can take weeks and allows destructive mold growth to begin in just 48 hours.

A cooperative agreement has been signed with Artifex Equipment, Inc., of

Penngrove, California, to continue tests to gauge Super Slurper’s ability to minimize wrinkling, swelling, and other damage caused by the wetting of paper. Research is also needed to show that the material doesn’t stain or alter ink and other pigments. *Kathleen C. Hayes, USDA-ARS National Agricultural Library, Beltsville, Maryland; phone (301) 504-5218, e-mail khayes@nal.usda.gov.*

GEORGE ROBINSON (K639-14)



A single flake of Super Slurper.

Sewing Things Up, Soilwise

Soil compaction causes farmers a lot of problems by preventing moisture from seeping down to plant roots and by increasing water runoff and wind erosion. But soil-compaction measuring devices that have been developed measure soil only at a few depths. This may be insufficient—particularly in the Southeast, where a thin hardpan may cause compaction to vary throughout each field. Hardpan is a dense layer of soil that restricts root growth as well as movement of moisture, air, and beneficial organisms through the soil.

To enable farmers to check soil compaction at various depths, researchers attached a sensor to the front of a shank. As a tractor draws the device through the field, the sensor moves up and down, like a needle on a sewing machine, assessing soil compaction as it goes. GPS technology can then be used to create soil-compaction maps, enabling farmers to adjust tillage depths accordingly. The sensor device may be coupled with other technologies to measure properties such

as soil moisture and electrical conductivity. *Randy L. Raper, USDA-ARS National Soil Dynamics Laboratory, Auburn, Alabama; phone (334) 844-4654, e-mail rlraper@msa-stoneville.ars.usda.gov.*

Nickel Deficit Can Cause Pecan Mouse-Ear

Pecan growers must pay attention to their trees’ nickel nutrition if they want to see optimal growth and productivity in their orchards. When pecan trees don’t absorb enough nickel from the soil, they’re prone to a disorder called mouse-ear. It first becomes evident on shoots in early spring and eventually causes abnormal tree growth and development. Severity can vary from year to year, and symptoms may not always appear in the same trees.

Researchers have found that other metals in the soil, such as zinc, cadmium, and copper, compete with nickel for the uptake channels in pecan trees’ feeder roots. Foliar applications of nickel—applied in spring, soon after bud break, or in the fall—can correct for the shortage. *Bruce W. Wood, Charles C. Reilly, and Andrew P. Nyczepir, USDA-ARS Southeastern Fruit and Tree Nut Research Laboratory, Byron, Georgia; phone (478) 956-6421 [Wood], e-mail bwwood@saa.ars.usda.gov, creilly@saa.ars.usda.gov, anyczepir@saa.ars.usda.gov.*